touchpads, mice, etc. For one, the touch screen **70** is positioned in front of the display **68** and therefore the user can manipulate the GUI **69** directly. For example, the user can simply place their finger over an object to be controlled. In touch pads, there is no one-to-one relationship such as this. With touchpads, the touchpad is placed away from the display typically in a different plane. For example, the display is typically located in a vertical plane and the touchpad is typically located in a horizontal plane. This makes its use less intuitive, and therefore more difficult when compared to touch screens. In addition to being a touch screen, the input device **70** can be a multipoint input device. Multipoint input devices have advantages over conventional singlepoint devices in that they can distinguish more than one object (finger). Singlepoint devices are simply incapable of distinguishing multiple objects. By way of example, a multipoint touch screen, which can be used herein, is shown and described in greater detail in copending and commonly assigned U.S. patent application Ser. No. 10/840,862, which is hereby incorporated herein by reference.

[0058] The computer system **50** also includes capabilities for coupling to one or more I/O devices **80**. By way of example, the I/O devices **80** may correspond to keyboards, printers, scanners, cameras, speakers, and/or the like. The I/O devices **80** may be integrated with the computer system **50** or they may be separate components (e.g., peripheral devices). In some cases, the I/O devices **80** may be connected to the computer system **50** through wired connections (e.g., cables/ports). In other cases, the I/O devices **80** may be connected to the computer system **80** through wireless connections. By way of example, the data link may correspond to PS/2, USB, IR, RF, Bluetooth or the like.

[0059] In accordance with one embodiment of the present invention, the computer system **50** is designed to recognize gestures **85** applied to the input device **70** and to control aspects of the computer system **50** based on the gestures **85**. In some cases, a gesture is defined as a stylized interaction with an input device that is mapped to one or more specific computing operations. The gestures **85** may be made through various hand, and more particularly finger motions. Alternatively or additionally, the gestures may be made with a stylus. In all of these cases, the input device **70** receives the gestures **85** and the processor **56** executes instructions to carry out operations associated with the gestures **85**. In addition, the memory block **58** may include a gesture operational program **88**, which may be part of the operating system or a separate application. The gestural operation program **88** generally includes a set of instructions that recognizes the occurrence of gestures **85** and informs one or more software agents of the gestures **85** and/or what action(s) to take in response to the gestures **85**.

[0060] When a user performs one or more gestures, the input device **70** relays gesture information to the processor **56**. Using instructions from memory **58**, and more particularly, the gestural operational program **88**, the processor **56** interprets the gestures **85** and controls different components of the computer system **50**, such as memory **58**, a display **68** and I/O devices **80**, based on the gestures **85**. The gestures **85** may be identified as commands for performing actions in applications stored in the memory **58**, modifying GUI objects shown on the display **68**, modifying data stored in memory **58**, and/or for performing actions in I/O devices **80**. By way of example, the commands may be associated with zooming, panning, scrolling, paging, rotating, sizing, and the like. As further examples, the commands may also be associated with launching a particular program, opening a file or document, viewing a menu, making a selection, executing instructions, logging onto the computer system, permitting authorized individuals access to restricted areas of the computer system, loading a user profile associated with a user's preferred arrangement of the computer desktop, and/or the like.

[0061] A wide range of different gestures can be utilized. By way of example, the gestures may be single point or multipoint gestures; static or dynamic gestures; continuous or segmented gestures; and/or the like. Single point gestures are those gestures that are performed with a single contact point, e.g., the gesture is performed with a single touch as for example from a single finger, a palm or a stylus. Multipoint gestures are those gestures that can be performed with multiple points, e.g., the gesture is performed with multiple touches as for example from multiple fingers, fingers and palms, a finger and a stylus, multiple styli and/or any combination thereof. Static gestures are those gestures that do not include motion, and dynamic gestures are those gestures that do include motion. Continuous gestures are those gestures that are performed in a single stroke, and segmented gestures are those gestures that are performed in a sequence of distinct steps or strokes.

[0062] In one embodiment, the computer system **50** is configured to register multiple gestures at the same time, i.e., multiple gestures can be performed simultaneously. By way of example, a zoom gesture may be performed at the same time as a rotate gesture, or a rotate gesture may be performed at the same time as a pan gesture. In one particular implementation, zoom, rotate and pan gestures can all occur simultaneously in order to perform zooming, rotating and panning at the same time.

[0063] In another embodiment, the system is configured to immediately recognize the gestures so that actions associated with the gestures can be implemented at the same time as the gesture, i.e., the gesture and action simultaneously occur side by side rather than being a two-step process. By way of example, during a scrolling gesture, the screen moves with the finger motion.

[0064] In another embodiment, an object presented on a display **68** continuously follows the gesture occurring on a touch screen. There is a one to one relationship between the gesture being performed and the objects shown on the display **68**. For example, as the gesture is performed, modifications simultaneously occur to the objects located underneath the gesture. For example, during a zooming gesture, the fingers may spread apart or close together in order to cause the object shown on the display **68** to zoom in during the spreading and zoom out during the closing. During this operation, the computer system **50** recognizes the user input as a zoom gesture, determines what action should be taken, and outputs control data to the appropriate device, in this case the display **68**.

[0065] In another embodiment, the computer system **50** provides region sensitivity where gestures mean different things when implemented over different areas of the input device **68**. For example, a rotation gesture over a volume knob causes volume increase/decrease, whereas a rotation gesture over a photo causes rotation of the photo.